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Enneapterygius trisignatus, a New Species from Northern Grande Terre, with a Key to New Caledonian Tripterygiid Fishes (Teleostei)

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With 1 figure

Summary

Enneapterygius trisignatus **n. sp.** is described from the northern end of Grande Terre, New Caledonia, Southwest Pacific. The new species is characterized by having 15–16 + 18–20 lateral line scales, 1 symphyseal mandibular pore (total mandibular pores 11), a low first dorsal fin, the head without a dark mask in males, the body gray, with 2 horizonal rows of white spots, the caudal peduncle with an anterior white, a central brown, and a posterior black band; a gray anal fin; and the caudal and pectoral fins white in preservative (red in life). It is compared with allied species.

A key to the Tripterygiidae of New Caledonia is presented.

Zusammenfassung

Die **neue Art** *Enneapterygius trisignatus* wird vom Nordende der Insel Grande Terre (Neukaledonien, Südwestpazifik) beschrieben. Sie ist durch die folgenden Merkmale charakterisiert: 15–16 + 18–20 Seitenlinienschuppen, eine Mandibularpore an der Symphysis (Gesamtzahl der Mandibularporen 11), erste Rückenflosse niedrig, Kopf beim Männchen ohne schwarze Maske, Körper grau, mit zwei waagerechten Reihen weißer Punkte, Schwanzstiel mit einem vorderen weißen, einem mittleren braunen und einem hinteren schwarzen Band; Afterflosse grau; Schwanzflosse und Brustflossen in Konservierungsmittel weiß (Lebendfärbung rot). Die neue Art wird mit verwandten Arten verglichen.

Ein Bestimmungsschlüssel der Tripterygiidae Neukaledoniens wird vorgelegt.

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SHOUT
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1. Introduction

Tripterygiid fishes (triplefins or threefin blennies) are a family of bottom living blennioid fishes, characterized by having scales on the sides of the body and three dorsal fins, inhabiting cold, temperate, subtropical and tropical sea shores and offshore islands. They are usually associated with hard substrates. Most species live subtidally on rocky or coral reefs or in intertidal rock pools; a few occur deeper, on the continental shelf and slopes down to at least 550 m depth. The use of modern collecting techniques like rotenone collections has revealed that the Tripterygiidae is a large and abundant group. 30 genera and approximately 150 species are known worldwide. All species are small: the largest does not exceed 150 mm SL (*Blennodon dorsale,* New Zealand), the smallest attains 20 mm SL.

The only attempts to review the entire group were by SCHULTZ (1950) and ROSENBLATT (1959, unpublished doctoral dissertation). SCHULTZ (1950) presented a key to the genera and made an attempt to clarify the taxonomy of the New World species. He only recognized five genera, and synonymized most of the previously described genera with *Tripterygion.* ROSENBLATT (1959) again revised the family, and recognized 18 valid genera, with a worldwide total of about 95 species; he excluded from his revision the most speciate genera *Enneapterygius* Rüppell, 1835 and *Helcogramma* McCulloch & Waite, 1918. The revision mostly concentrated on eastern Pacific species; other areas were only treated on the generic level.

Since the early 1980s, attempts of regional revisions or revisions of single genera were made. CLARK (1980) revised the Tripterygiidae of the Red Sea, HOLLEMAN (1986) the species of South Africa. KUITER (1986) published on a number of southern Australian *Norfolkia* (now *Trinorfolkia*) species and described the new genus *Apopterygion.* GRAHAM HARDY made revisionary studies on a number of New Zealand triplefin genera (HARDY, 1984, 1986, 1987a, 1987b, 1987c, 1987d, 1989a, 1989b). HANSEN (1986) revised the genus *Helcogramma.* HOLLEMAN (1987) published a revision of *Ceratobregma.* More recently, *Norfolkia* (sensu strictu) was revised by HOLLEMAN (1991); the new genera *Ucla* Holleman, 1993 and *Acanthanectes* Holleman & Buxton, 1993 (HOLLEMAN & BUXTON, 1993) were described. A number of recent papers were dealing with East Pacific Tripterygiidae, including descriptions of new genera and species (ALLEN & ROBERTSON, 1991, 1992; BUSSING, 1991). The new generic name *Helcogrammoides* Rosenblatt in Gon, 1991 (ROSENBLATT in GON, 1991: 400–401) was described for the single Antarctic and two South American species. The new generic name *Grahamina* was attributed to 4 species from New Zealand and Tasmania (FRICKE & ROBERTS, 1993). FRICKE (1994a) described two new species, *Enneapterygius unimaculatus* and *E. ziegleri* from Bali, Indonesia. FRICKE (1994b) revised the Tripterygiidae of Australia, New Zealand and the Southwest Pacific, distinguishing 70 species in 22 genera, including the description of 2 new genera and 16 new species. SHEN & WU (1994) published a revision of Taiwanese triplefins, describing two new genera and five new species. RANDALL (1995) described three new species of *Enneapterygius* from Oman. FRICKE (1997) revised the Tripterygiidae of the western and central Pacific, including descriptions of 15 new species, and presented a worldwide checklist of the species, distinguishing 30 valid genera and 140 valid species of triplefins. FRICKE's (1997) revision included 23 species recorded from New Caledonia. FRICKE (in press) again revised the Tripterygiidae of New Caledonia in the light of

new data, recording a total of 27 species from the area, with 26 species living in Grande Terre.

Recent investigations in Grande Terre by the author of the present paper resulted in specimens of an unknown species that is described in the present paper.

2. Methods, materials and acknowledgments

Methods: Descriptive methods follow FRICKE (1997). Proportions are expressed in thousands of standard length *(SL).* In the description of the new species, the proportional data of the paratypes follow those of the holotype (or lectotype, neotype), in *parentheses,* e.g. 135 (132–140). Counts and measurements (using dial calipers) were taken directly point-to-point in a straight line following the method of HUBBS & LAGLER (1958, 1964), and as modified by FRICKE (1983) for counting fin rays. In the identification key, some species of *Enneapterygius* can only be identified easily if they are males; their females are much more difficult to distinguish, only if ecological data, geographical distribution and accompanying males are known.

Materials: The specimens described in the present paper are deposited in the following institutions:
MNHN Muséum National d'Histoire Naturelle, Paris, France;
NTUM National Taiwan University, Taipei, Taiwan;
SMNS Staatliches Museum für Naturkunde, Stuttgart, Germany.

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3. Key to New Caledonian Tripterygiidae

1 First dorsal fin with 4 spines ..... *Norfolkia,* **2**
– First dorsal fin with 3 spines **4**

2 Anterior lateral line series with 17 or less tubular pored scales **3**
– Anterior lateral line series with 18 or more tubular pored scales .....
..... ***Norfolkia squamiceps*** (McCulloch & Waite, 1916)

3 Anal fin with 2 spines and 16–20 soft rays; anal fin with about 10 transverse dark streaks; sides of body with about 6 double vertical brown streaks .....
..... ***Norfolkia brachylepis*** (Schultz, 1960)
– Anal fin with 2 spines and 20–21 soft rays; anal fin without transverse streaks, but with 6 basal dark spots, each ray with a small distal dark spot; sides of body with about 6 simple broad vertical bars, and with about 10 quadrangular blotches below the lateral line .....
..... ***Norfolkia thomasi*** Whitley, 1964

4 Lateral line continuous, consisting of a single series of tubular pored scales **5**
– Lateral line discontinuous, consisting of an anterior series of tubular pored scales, and a posterior series of notched scales (continuing 0–4 rows lower) **9**

5 Lower jaw shorter than upper jaw; lateral line only consisting of tubular pored scales ....
..... *Helcogramma,* **6**
– Lower jaw longer and broader than upper jaw; lateral line anteriorly with tubular pored scales, posteriorly with centrally depressed scale ... ***Ucla xenogrammus*** Holleman, 1993

6 Symphyseal mandibular pores 3–9 (total pores 7–25) **7**
– Symphyseal mandibular pores 1–2 (total pores 7–18) **8**

7 Head in male with a narrow horizontal suborbital white streak; transverse scales 9–10 + 9–10 ..... ***Helcogramma trigloides*** (Bleeker, 1858)
– Head in male without a horizontal suborbital streak; transverse scales 6–7 + 7–8 ..... ***Helcogramma hudsoni*** (Jordan & Seale, 1906)

8 Supraorbital tentacle present ..... ***Helcogramma* sp. 7** („Safra triplefin")
– Supraorbital tentacle absent ..... ***Helcogramma novaecaledoniae*** Fricke, 1994

9 Pectoral fin base naked or scaled, belly completely or half scaled; 2 anal fin spines (may be fused) **10**
– Pectoral fin base and belly scaleless; 1 anal fin spine ..... *Enneapterygius,* **11**

10 Caudal fin pale, occasionally striped; anal fin with 2 separate spines; anterior margin of eyes in males with 3 large spines ..... ***Ceratobregma helenae*** Holleman, 1987
– Caudal fin black; anal fin with 2 fused spines; anterior margin of eye in males with 3 small knobs ..... ***Springerichthys kulbickii*** (Fricke & Randall in Fricke, 1994)

11 Tubular pored lateral line scales in the anterior series 5–13 ..... **12**
– Tubular pored lateral line scales in the anterior series 14–23 ..... **20**

12 Symphyseal mandibular pores 1 (total pores 5–13) **13**
– Symphyseal mandibular pores 2–8 (total pores 6–22) **17**

13 Caudal fin black in male **14**
– Caudal fin pale or spotted in male **16**

14 Pelvic fins black in male ..... ***Enneapterygius philippinus*** (Peters, 1869)
– Pelvic fins pale in male **15**

15 Posterior two-thirds of body in male plain black ..... ***Enneapterygius flavoccipitis*** Shen & Wu, 1994
– Posterior two-thirds of body in male light, with vertical black streaks and triangles above anal fin base ..... ***Enneapterygius bowensis*** Fricke, 1997

16 Anal fin plain black in male; posterior two-thirds of body black in male ..... ***Enneapterygius flavoccipitis*** Shen & Wu, 1994
– Anal fin half black in male; posterior one-third of body black in male ..... ***Enneapterygius hemimelas*** (Kner & Steindachner, 1867)

17 Posterior half or anal fin black in male ..... ***Enneapterygius hemimelas*** (Kner & Steindachner, 1867)
– Anal fin pale, spotted or striped in male **18**

18 First dorsal fin higher than second dorsal fin ..... ***Enneapterygius tutuilae*** Jordan & Seale, 1906
– First dorsal fin lower than second dorsal fin **19**

19 Body pale, head with a black mask ..... *Enneapterygius nanus* (Schultz in Schultz et alii, 1953)
– Body black or striped, head black ..... ***Enneapterygius niger*** Fricke, 1994

20 Caudal fin black in male (at least half black) **21**
– Caudal fin pale, spotted or striped in male **25**

21 Anal fin black in male (at least posterior half) **22**
– Anal fin pale, spotted or striped in male ..... ***Enneapterygius niger*** Fricke, 1994

22 Pelvic fin black in male ..... ***Enneapterygius philippinus*** (Peters, 1869)
– Pelvic fin pale in male **23**

23 Lower sides of body with triangular black blotches above anal fin base ..... ***Enneapterygius bowensis*** Fricke, 1997
– No triangular black blotches above anal fin base **24**

24 Posterior half of anal fin black in male, anterior half pale ..... ***Enneapterygius similis*** Fricke, 1997
– Anal fin plain black in male ..... ***Enneapterygius flavoccipitis*** Shen & Wu, 1994

25 Anal fin plain black in male (at least the posterior half) or plain dark gray **26**
– Anal fin pale, spotted or striped in male **35**

26 Symphyseal mandibular pores 1 (total pores 5–12) **27**
– Symphyseal mandibular pores 2–4 (total pores 6–12) **32**

27 Posterior half of anal fin black in male, anterior half pale ..... ***Enneapterygius hemimelas*** (Kner & Steindachner, 1867)
– Anal fin plain black or dark gray in male **28**

28 Third dorsal fin plain in male ..... ***Enneapterygius williamsi*** Fricke, 1997
– Third dorsal fin pale, striped, or at most basally dusky **29**

29 Second dorsal fin plain black in male **30**
– Second dorsal fin pale, striped, or at most basally dusky **31**

30 Sides of body dark in male, with 3 horizontal series of white blotches ..... ***Enneapterygius triserialis*** Fricke, 1994
– Sides of body light in male, with large triangular dark blotches reaching from the anal fin base towards the dorsal fin bases ..... ***Enneapterygius rhabdotus*** Fricke, 1994

31 Posterior two-thirds of body including caudal peduncle plain dark gray in male ..... ***Enneapterygius flavoccipitis*** Shen & Wu, 1994
– Caudal peduncle with a vertical white, a brown, and a black stripe in male; body gray, with 2 horizontal rows of whitish spots in male ..... ***Enneapterygius trisignatus*** **n. sp.**

32 Posterior half of anal fin black in male, anterior half pale ..... ***Enneapterygius hemimelas*** (Kner & Steindachner, 1867)
– Anal fin plain black in male **33**

33 Third dorsal fin plain black in male **34**
– Third dorsal fin pale, striped, or at most basally dusky ..... ***Enneapterygius paucifasciatus*** Fricke, 1994

34 Caudal fin with a central black bar; body striped posteriorly; symphyseal mandibular pores 3–4 ..... ***Enneapterygius rhabdotus*** Fricke, 1994
– Caudal fin plain pale; body plain black in male; symphyseal mandibular pores 1–2 ..... ***Enneapterygius williamsi*** Fricke, 1997

35 Symphyseal mandibular pores 1 (total pores 5–19) **36**
– Symphyseal mandibular pores 2–4 (total pores 6–12) **38**

36 Second dorsal fin black in male (at least distal half) **37**
– Second dorsal fin pale (rarely spotted) **40**

37 Body grayish, with 3 horizontal series of white blotches in male ..... ***Enneapterygius triserialis*** Fricke, 1994
– Body either plain black or striped ..... ***Enneapterygius niger*** Fricke, 1994

38 Caudal peduncle with an hourglass marking consisting of a dorsal and a ventral black blotch ..... ***Enneapterygius elegans*** (Peters, 1877)
– Caudal peduncle without an hourglass marking (but may have a vertical dark streak or an oblique bar) **39**

39 Caudal peduncle blackish in male (red in life); remaining parts of body pale ..... ***Enneapterygius rubicauda*** Shen & Wu, 1994
– Caudal peduncle not blackish in male; body may be pale or banded ..... ***Enneapterygius rufopileus*** (Waite, 1904)

40 Second dorsal fin pale or spotted . ***Enneapterygius nanus*** (Schultz in Schultz et alii, 1953)
– Second dorsal fin blackish **41**

41 Head and body plain blackish in male, head with a vertical suborbital white streak ..... ***Enneapterygius niger*** Fricke, 1994
– Head and body not plain blackish, head may have a black mask, but no suborbital white streak **42**

42 First dorsal fin in male higher than second dorsal fin; body grayish, anteriorly with narrow vertical streaks, posteriorly without streaks or bars ..... ***Enneapterygius paucifasciatus*** Fricke, 1994
– First dorsal fin lower than second dorsal fin; body colouration not as described in 42 ... ***Enneapterygius rhothion*** Fricke, 1997.

4. *Enneapterygius trisignatus* n. sp. (Fig. 1)

New Caledonian flagtail triplefin

Enneapterygius sp.: Fricke, in press: (Province Nord, Grande Terre, New Caledonia).

Material

Total: 3 specimens.

Holotype. **New Caledonia, Grande Terre:** SMNS 22074, 20.4 mm SL; northern end of island, Province Nord, 1 km east of Pointe Naharian, 20 km north of Poum, 20°04'18"S 164°00'15"E, 1–3 m depth; R. Fricke; 11 May 2000.

Paratypes. **New Caledonia, Grande Terre:** MNHN 2000–1447, 1 specimen; same data as the holotype. – SMNS 22085, 1 specimen; north coast of island, Province Nord, 8 km east-southeast of Tiari, 12 km northnorthwest of Ouégoa, 20°15'20"S 164°24'10"E, 0.5–3.5 m depth; R. Fricke; 12 May 2000.

Etymology

"Tri" (Latin) means three; *"signatus"* (Latin) means signed. The name refers to the triple marking (white-brown-black) on the caudal peduncle of the new species.

Diagnosis

A medium-sized species of the *Enneapterygius-flavoccipitis* species-group with 15–16 + 18–20 lateral line scales, 1 symphyseal mandibular pore (total mandibular pores 11), a low first dorsal fin, and head without a dark mask in males, the body

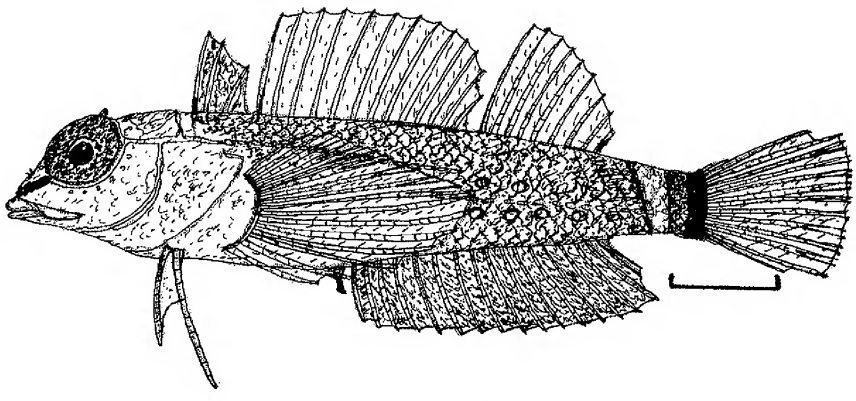

Fig. 1. *Enneapterygius trisignatus* n. sp., New Caledonia, Grande Terre, north coast, 1 km east of Pointe Naharian; SMNS 22074, holotype, 20.4 mm SL; lateral view. – Scale: 3 mm.

gray, with 2 horizontal rows of white spots, the caudal peduncle with an anterior white, a central brown, and a posterior black band; anal fin gray; caudal fin white (red in life).

Description

D_1 III (III); D_2 XIII (XII–XIII); D_3 viii,1 (viii,1-ix,1); A I,xv,1, total 17 (I,xv-xvii,1, total 17–19); P_1 ii,7,vii, total 16 (ii-iii,7,vii-viii, total 16–18); P_2 I,ii (I,ii); C (vii),ii,9,ii,(vi) ((viii-ix),ii,9,ii,(vii-viii)). Scale rows 32 (31–33). Transverse scale rows 5 + 1 + 5 (5 + 1 + 5). Lateral line scales 15 + 19 (15–16 + 18–20). Mandibular pore formula 5 + 1 + 5 (5 + 1 + 5).

Head length 304 (296–305). Eye diameter 118 (111–122). Supraorbital tentacle slender, its length 39 (35–39). Interorbital distance 29 (31–34). Preorbital length 56 (59–63). Upper jaw length 105 (106–112). Posttemporal lateral line branch I-shaped. Body depth 216 (203–227). Body width 159 (184–189). Lateral line consisting of an anterior series of 15–16 tubular pored scales, reaching to below end of second dorsal fin base; continuing two rows lower with a posterior series of 18–20 notched scales. Caudal peduncle length 130 (148–158). Caudal peduncle depth 83 (75–89).

First dorsal fin low; first spine 123 (92–97), second spine 118 (90–95), third spine 98 (90–93). Predorsal (1) length 267 (262–270). First spine of second dorsal fin 176 (165–166), 5th spine 167 (170–179). Predorsal (2) length 353 (342–361). First ray of third dorsal fin 176 (174), 5th ray 132 (121–123). Predorsal (3) length 669 (683–730). Anal fin beginning below vertical through 5th–6th membrane of second dorsal fin (below 10th–11th lateral line pore). Anal spine 83 (94–97); 5th anal ray 118 (111–120), penultimate ray 125 (116–133). Preanal fin length 498 (518–523). Pectoral fin reaching about to base of 7th anal fin membrane. Pectoral fin length 316 (298–349). Prepectoral fin length 346 (324–334). First ray of pelvic fin 147 (138–150), 2nd ray 206 (184–213). Prepelvic fin length 218 (240–242). Caudal fin length 203 (201–240).

Colour in life. Head and body grayish brown, sides of body with two horizontal rows of whitish spots. Caudal peduncle with an anterior vertical white band, a central brown band and a posterior black band. First dorsal fin dusky, second and third dorsal fins reddish. Caudal fin red. Pectoral fins red.

Colour in alcohol. Head pale, eye dark gray, occiput reddish, preorbital area with an oblique dark streak. Operculum and pectoral fin base with pigmented areas. Body gray, with two horizontal series of whitish spots. Caudal peduncle with an anterior white, a central brown, and a posterior black band. First dorsal fin grayish; second and third dorsal fins translucent. Anal fin gray. Caudal fin white. Pectoral and pelvic fins translucent.

Distribution

This new species is known only from the extreme northern coast of Grande Terre, New Caledonia. It was found in crevices of coralline rocks in the walls of channels in the fringing reef, at depths of 2–3 m.

Relationships

The new species is most closely allied to *Enneapterygius flavoccipitis* Shen & Wu, 1994 (Shen & Wu, 1994: 8–11, fig. 6, tab. 2, Ho-bi-hou, S Taiwan, holotype: NTUM 07836; Fricke, 1997: 199–209, fig. 36, tabs 44–49, revision, New Caledonia, Loyal-

ty Islands, etc.) which is distinguished by the male colouration (anterior third of body pale, posterior two-thirds plain blackish, without bands on the caudal peduncle; head with a broad mask and dense pigmentation). The colouration of the new species is similar to *Enneapterygius rubicauda* Shen & Wu, 1994 (SHEN & WU, 1994: 17–18, fig. 11, Liu-chiu/Liuchiu Island, off SW Taiwan, holotype: NTUM 07806; FRICKE, 1997: 310–314, fig. 65, revision, Loyalty Islands), which differs in having the whole caudal peduncle plain black in the male, a black head mask, and a pale anal fin.

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